

SEQUENCE LISTING

<110> Gillies, Stephen
Lo, Kin Ming

<120> Multiple Cytokine Protein Complexes

<130> LEX-Q10

<140>

<141>

<150> 60/147,924

<151> 1999-08-09

<160> 32

<170> PatentIn Ver. 2.0

<210> 1

<211> 582

<212> DNA

<213> Mus musculus

<220>

<223> Description of Artificial Sequence: murine p35
coding sequence for mature protein

<400> 1

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accacagatg acatggtgaa gacggccaga gaaaaactga aacattattc ctgcaactgct 120
gaagacatcg atcatgaaga catcacacgg gaccaaacca gcacattgaa gacctgttta 180
ccactggaac tacacaagaa cgagagttgc ctggctacta gagagacttc ttccacaaca 240
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aatcacaacc atcagcagat cattctagac aagggcatgc tgggtggccat cgatgagctg 420
atgcagtcctc tgaatcataa tggcgagact ctgcgccaga aacctcctgt gggagaagca 480
gacccttaca gagtgaataa gaagctctgc atcctgcttc acgccttcag caccgcgctc 540
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<210> 2

<211> 1472

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: murine
p40-IL-2 fusion protein coding sequence

<400> 2

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ttttgctggt gtctccaçtc atggccatgt gggagctgga gaaagacgtt tatgtttag 120
agggtggactg gactcccgat gcccctggag aaacagtga cctcacctgt gacacgcctg 180
aagaagatga catcacctgg acctcagacc agagacatgg agtcatagge tctggaaaga 240
ccctgaccat cactgtcaaa gagtttctag atgctggcca gtacacctgc cacaaggag 300
gagagactct gagccactca catctgctgc tccacaagaa ggaaaatgga atttggcca 360
ctgaaatttt aaaaaatttc aaaaacaaga ctttcttgaa gtgtgaagca ccaaattact 420

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ccggacgggt cactgctca tggctgggtc aaagaaacat ggacttgaag ttcaacatca 480
agagcagtag cagttcccct gactctcggg cagtgcacatg tggaatggcg tctctgtctg 540
cagagaaggt cacactggac caaagggact atgagaagta ttcagtgtcc tgccaggagg 600
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tcatcagcaa tatcagagta actgttgtaa aactaaaggg ctctgacaac acatttgagt 1380
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<210> 3

<211> 1409

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: murine
p40-GM-CSF fusion protein coding sequence

<400> 3

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atgtgtcctc agaagctaac atgtgtcctc agaagctaac catctcctgg tttgccatcg 60
ttttgtctgg gtctccactc atggccatgt gggagctgga gaaagacgtt tatgtttag 120
agggtgactg gactcccgat gccctggag aaacagtga cctcacctgt gacacgcctg 180
aagaagatga catcacctgg acctcagacc agagacatgg agtcatagga tctggaaaga 240
ccctgacctc cactgtcaaa gagtttctag atgtgtggca gtacacctgc cacaaggag 300
gcgagactct gagccactca catctgtctg tccacaagaa ggaaaatgga atttggtcca 360
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ccggacgggt cactgctca tggctgggtc aaagaaacat ggacttgaag ttcaacatca 480
agagcagtag cagttcccct gactctcggg cagtgcacatg tggaatggcg tctctgtctg 540
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tgacagccag ctactaccag acatactgcc ccccaactcc ggaaacggac tgtgaaacac 1320
aagttaccac ctatgcggat tcatagaca gccttaaac ctttctgact gatatcccct 1380
ttgaatgcaa aaaaccaagc caaaaatga 1409

```

<210> 4

<211> 1389

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: human
p40-IL-2 fusion protein coding sequence

<400> 4

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gtggccatat gggaaactgaa gaaagatgtt tatgtcgtag aattggattg gtatccggat 120
gcccttggag aaatggtggt cctcacctgt gacacccttg aagaagatgg tatcacctgg 180
accttggacc agagcagtga ggtcttaggc tctggcaaaa cctgaccat ccaagtcaaa 240
gagtttggag atgctggcca gtacacctgt cacaaaggag gcgaggttct aagccattcg 300
ctcctgctgc ttcacaaaaa ggaagatgga atttggtcca ctgatatttt aaaggaccag 360
aaagaaccca aaaataagac ctttctaaga tgcgaggcca agaattattc tggacgtttc 420
acctgctggt ggctgacgac aatcagtact gatttgacat tcagtgtcaa aagcagcaga 480
ggctcttctg accccaagg ggtgacgtgc ggagctgcta cactctctgc agagagagtc 540
agaggggaca acaaggagta tgagtactca gtggagtgcc aggaggacag tgcctgcccc 600
gctgctgagg agagtctgcc cattgaggtc atgggtggatg ccgttcacaa gctcaagtat 660
gaaaactaca ccagcagctt cttcatcagg gacatcatca aacctgaccc acccaagaac 720
ttgcagctga agccattaaa gaattctcgg caggtggagg tcagctggga gtaccctgac 780
acctggagta ctccacattc ctacttctcc ctgacattct gcgttcaggc ccagggcaag 840
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cgcaaaaatg ccagcattag cgtgcggggc caggaccgct actatagctc atcttggagc 960
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aatcccaaac tcaccaggat gtcacattt aagttttaca tgccaagaa ggccacagaa 1140
ctgaaacatc ttcagtgtct agaagaagaa ctcaaacctc tggaggaagt gctaaattta 1200
gctcaaagca aaaactttca cttaagacct agggacttaa tcagcaatat caacgtaata 1260
gttctggaac taaagggatc tgaaacaaca ttcattgtgt aatatgctga tgagacagca 1320
accattgtag aatttctgaa cagatggatt accttttgtc aaagcatcat ctcaacacta 1380
acttgataa                                     1389
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<210> 5

<211> 1278

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: murine
Fc-p35 fusion protein coding sequence

<400> 5

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gagcccagag ggcccacaat caagccctgt cctccatgca aatgcccagc acctaacctc 60
ttgggtggac catccgtctt catcttccct ccaaagatca aggatgtact catgatctcc 120
ctgagcccca tagtcacatg tgtggtggtg gatgtgagcg aggatgaccc agatgtccag 180
atcagctggt ttgtgaacaa cgtggaagta cacacagctc agacacaaac ccatagagag 240
gattacaaca gtactctccg ggtggtcagt gccctcccca tccagacca ggactggatg 300
agtggcaagg agttcaaatg caaggtaaac aacaaagacc tcccagcgcc catcgagaga 360
accatctcaa aacccaaagg gtcagtaaga gctccacagg tatatgtctt gcctccacca 420
gaagaagaga tgactaagaa acaggtaact ctgacctgca tggtcacaga cttcatgcct 480
gaagacattt acgtggagtg gaccaacaac gggaaaacag agctaaacta caagaacact 540
gaaccagtcc tggactctga tggttcttac ttcattgtaca gcaagctgag agtggaaaag 600
aagaactggg tggaaagaaa tagctactcc tgttcagtgg tccacgaggg tctgcacaat 660
caccacagca ctaagagctt ctcccggacc cgggtagggg tcattccagt ctctggacct 720
gccaggtgtc ttagccagtc ccgaaacctg ctgaagacca cagatgacat ggtgaagacg 780
gccagagaaa aactgaaaca ttattcctgc actgctgaag acatcgatca tgaagacatc 840
acacgggacc aaaccagcac attgaagacc tgtttaccac tggaactaca caagaacgag 900
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agttgcctgg ctactagaga gacttcttcc acaacaagag ggagctgcct gccccacag 960
aagacgtctt tgatgatgac cctgtgcctt ggtagcatct atgaggactt gaagatgtac 1020
cagacagagt tccaggccat caacgcagca cttcagaatc acaaccatca gcagatcatt 1080
ctagacaagg gcatgctggg ggccatcgat gagctgatgc agtctctgaa tcataatggc 1140
gagactctgc gccagaaacc tcctgtggga gaagcagacc cttacagagt gaaaatgaag 1200
ctctgcatcc tgcttcacgc cttcagcacc cgcgtcgtga ccatcaacag ggtgatgggc 1260
tatctgagct ccgcctga                                     1278

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<210> 6

<211> 1287

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: human Fc-p35
fusion protein coding sequence

<400> 6

```

gagcccaaat cttgtgacaa aactcacaca tgcccaccgt gcccagcacc tgaactcctg 60
gggggacogt cagtcttcct cttcccccca aaaaccaagg acaccctcat gatctcccg 120
acccttgagg tcacatgcgt ggtggtggac gtgagccacg aagaccctga ggtcaagtgc 180
aactggtacg tggacggcgt ggaggtgcat aatgccaaaga caaagccgcg ggaggagcag 240
tacaacagca cgtaccgtgt ggtcagcgtc ctcaccgtcc tgcaccagga ctggctgaat 300
ggcaaggagt acaagtgcaa ggtctccaac aaagccctcc cagcccccat cgagaaaacc 360
atctccaaag ccaaagggca gccccgagaa ccacaggtgt acaccctgcc cccatcacgg 420
gaggagatga ccaagaacca ggtcagcctg acctgcctgg tcaaaggcct ctatcccagc 480
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gcctccagaa agacctcttt tatgatggcc ctgtgcctta gtagtattta tgaagacttg 1020
aagatgtacc aggtggagtt caagaccatg aatgcaaagc ttctgatgga tcctaagagg 1080
cagatctttc tagatcaaaa catgctggca gttattgatg agctgatgca ggccctgaat 1140
ttcaacagtg agactgtgcc aaaaaatcc tccttgaaag aaccggattt ttataaaact 1200
aaaatcaagc tctgcatact tcttcatgct ttcagaattc gggcagtgac tattgacaga 1260
gtgacgagct atctgaatgc ttcttaa                                     1287

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<210> 7

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: forward primer
for construction of murine p40-IL-2 fusion
protein

<220>

<221> misc_feature

<222> (12)..(14)

<223> translation initiation codon

<400> 7

aagctagcac catgtgtcct cagaagctaa cc

32

<210> 8

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: reverse primer
for construction of murine p40-IL-2 fusion
protein

<220>

<221> misc_feature

<222> Complement((7)..(9))

<223> translation stop codon

<400> 8

ctcgagctag gatcggaccc tgcaggg

27

<210> 9

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: DNA sequence
at the junction of murine p40-IL-2 fusion protein

<220>

<221> misc_feature

<222> (14)..(16)

<223> encodes the C-terminal amino acid residue of
murine p40

<220>

<221> misc_feature

<222> (26)..(28)

<223> encodes the N-terminal amino acid residue of
mature murine IL-2

<400> 9

ctgcagggtc cgatccccgg gtaaagcacc c

31

<210> 10

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: DNA sequence
at the junction of single-chain murine IL12 and
GMCSF

<220>

<221> misc_feature

<222> (14)..(16)

<223> encodes the C-terminal amino acid residue of
murine p40

<220>

<221> misc_feature

<222> (26)..(28)

<223> encodes the N-terminal amino acid residue of
mature murine GMCSF

<400> 10

ctgcagggtc cgatccccgg gaaaagca

28

<210> 11

<211> 2013

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: murine
p35-linker-p40-IL-2 fusion protein coding sequence

<400> 11

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gaagacatcg atcatgaaga catcacacgg gaccaaacca gcacattgaa gacctgttta 180
ccactggaac tacacaagaa cgagagttgc ctggctacta gagagacttc ttccacaaca 240
agagggagct gcctgcccc acagaagacg tctttgatga tgacctgtg ccttggttagc 300
atctatgagg acttgaagat gtaccagaca gagttccagg ccatcaacgc agcacttcag 360
aatcacacc atcagcagat cattctagac aagggcatgc tgggtggccat cgatgagctg 420
atgcagtctc tgaatcataa tggcgagact ctgcgccaga aacctcctgt gggagaagca 480
gacctttaca gagtgaatat gaagctctgc atcctgcttc acgccttcag cccccgcgtc 540
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gcagagaagg tcacactgga ccaaaggac tatgagaagt attcagtgtc ctgccaggag 1140
gatgtcacct gcccaactgc cgaggagacc ctgccattg aactggcggt ggaagcacgg 1200
cagcagaata aatatgagaa ctacagcacc agcttcttca tcagggacat catcaaacca 1260
gacccgcccc agaacttgca gatgaagcct ttgaagaact cacaggtgga ggtcagctgg 1320
gagtaccctg actcctggag cactcccat tctacttct cctcaagtt ctttgttcga 1380
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gctcaggatc gctattacaa ttctcatgc agcaagtggg catgtgttcc ctgcagggtc 1560
cgatccccgg gtaaagcacc cacttcaagc tctacagcg aagcacagca gcagcagcag 1620
cagcagcagc agcagcagca gcacctggag cagctgttga tggacctaca ggagctcctg 1680
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ctgcggcatg ttctggattt gactcaaagc aaaagcttcc aattggaaga tgctgagaat 1860
ttcatcagca atatcagagt aactgttgta aaactaaagg gctctgacaa cacatttgag 1920
tgccaattcg atgatgagtc agcaactgtg gtggacttcc tgaggagatg gatagccttc 1980
tgtcaaagca tcattctcaac aagccctcaa taa 2013
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<210> 12
 <211> 1569
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: murine
 p35-linker-p40 fusion protein coding sequence

<400> 12
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 gaagacatcg atcatgaaga catcacacgg gaccaaacca gcacattgaa gacctgttta 180
 ccactggaac tacacaagaa cgagagttgc ctggctacta gagagacttc ttccacaaca 240
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 atctatgagg acttgaagat gtaccagaca gagttccagg ccatcaacgc agcacttcag 360
 aatcacaacc atcagcagat cattctagac aagggcatgc tgggtggccat cgatgagctg 420
 atgcagtctc tgaatcataa tggcgagact ctgcccaga aacctcctgt gggagaagca 480
 gaccettaca gagtgaatga gaagctctgc atcctgcttc acgccttcag caccgcgtc 540
 gtgaccatca acaggggtgat gggctatctg agctccgcgt cgagcggggg cagcgggggc 600
 ggaggcagcg gcgggggcgg atccgccatg tgggtgctgg agaaagacgt ttatgttgta 660
 gaggtggact ggactcccga tgcccctgga gaaacagtga acctcacctg tgacacgcct 720
 gaagaagatg acatcacctg gacctcagac cagagacatg gagtcatagg ctctggaaag 780
 accctgacca tcactgtcaa agagtttcta gatgctggcc agtacacctg ccacaaagga 840
 ggcgagactc tgagccactc acatctgctg ctccacaaga aggaaaatgg aatttgggtcc 900
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 cgatcctag 1569

<210> 13
 <211> 2709
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: murine
 Fc-p35-linker-p40-IL-2 fusion protein coding
 sequence

<400> 13
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 ctgagcccca tagtcacatg tgtggtgggt gatgtgagcg aggatgacct agatgtccag 180
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 gattacaaca gtactctccg ggtggtcagt cccctcccca tccagcacca ggactggatg 300
 agtggcaagg agttcaaag caaggtcaac aacaaagacc tcccagcgcc catcgagaga 360
 accatctcaa aacccaaagg gtcagtaaga gctccacagg tatatgtctt gcctccacca 420
 gaagaagaga tgactaagaa acaggtcact ctgacctgca tggtcacaga cttcatgcct 480

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gaagacattt acgtggagtg gaccaacaac gggaaaacag agctaaacta caagaacact 540
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aagaactggg tggaaagaaa tagctactcc tgttcagtgg tccacgaggg tctgcacaat 660
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gttgtaaaac taaagggtc tgacaacaca tttgagtgcc aattcgatga tgagtcagca 2640
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<210> 14

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: forward primer
for PCR amplification of murine p35 subunit of
IL-12

<220>

<221> misc_feature

<222> (16)..(18)

<223> translation initiation codon

<400> 14

aagcttgcta gcagcatgtg tcaatcacgc tac

33

<210> 15
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: reverse primer
 for PCR amplification of murine p35 subunit of
 IL-12

<220>
 <221> misc_feature
 <222> Complement((10)..(12))
 <223> translation stop codon

<400> 15
 ctcgagcttt caggcggagc tcagatagcc

30

<210> 16
 <211> 61
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: coding
 sequence at the junction between p35 and p40 that
 comprise the murine single-chain IL-12

<220>
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 <222> (8)..(10)
 <223> encodes the C-terminal amino acid residue of
 murine p35

<220>
 <221> misc_feature
 <222> (59)..(61)
 <223> encodes the N-terminal amino acid residue of
 mature murine p40

<400> 16
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 g 61

<210> 17
 <211> 16
 <212> PRT
 <213> Artificial Sequence

<220>
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 sequence at the junction between p35 and p40 that
 comprise the murine single-chain IL-12

<400> 17
 Ser Ser Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala
 1 5 10 15

<210> 18
<211> 73
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: coding
sequence at the junction between murine p40 and
the mature N-terminus of KS heavy chain

<220>
<221> misc_feature
<222> (14)..(16)
<223> encodes the C-terminal amino acid residue of
murine p40

<220>
<221> misc_feature
<222> (71)..(73)
<223> encodes the N-terminal residue of mature KS heavy
chain

<400> 18
ctgcagggtc cgatccccgg gatccggagg ttcagggggc ggaggtagcg gcggaggggg 60
ctccttaagc cag 73

<210> 19
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: protein
sequence at the junction between murine p40 and
the mature N-terminus of KS heavy chain

<400> 19
Pro Gly Ser Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser
1 5 10 15

Leu Ser

<210> 20
<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: coding
sequence at the junction between murine p35 and
the KS light chain

<220>

<221> misc_feature
<222> (8)..(10)
<223> encodes the C-terminal amino acid residue of
murine p35

<220>
<221> misc_feature
<222> (62)..(64)
<223> encodes the N-terminal amino acid residue of the
light chain

<400> 20
gagctccgcg tcgagcgggg gcagcggggg cggaggcagc ggcgggggcg gataccttaag 60
cgag 64

<210> 21
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: protein
sequence at the junction between murine p35 and
the KS light chain

<400> 21
Ser Ser Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Leu
1 5 10 15

Ser

<210> 22
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: forward primer
for the PCR amplification of murine IL-4

<220>
<221> misc_feature
<222> (9)..(11)
<223> translation initiation codon

<400> 22
tctagaccat gggtctcaac ccccagc 27

<210> 23
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: reverse primer

for the PCR amplification of murine IL-4

<220>

<221> misc_feature

<222> Complement((8)..(10))

<223> encodes the C-terminal amino acid residue of
murine IL-4

<400> 23

cggatcccgga gtaatccatt tgcgatgatgc tcttttaggct ttccagg

47

<210> 24

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: coding
sequence at the junction of murine IL-4 and the
mature KS-1/4 light chain

<220>

<221> misc_feature

<222> (1)..(3)

<223> encodes the C-terminal serine residue of murine
IL-4

<220>

<221> misc_feature

<222> (55)..(57)

<223> encodes the N-terminal amino acid residue of the
mature KS-1/4 light chain

<400> 24

tcgggatccg gaggttcagg gggcggaggt agcggcggag ggggctcctt aagcgag

57

<210> 25

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: protein
sequence at the junction of murine IL-4 and the
mature KS-1/4 light chain

<400> 25

Ser Gly Ser Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

Leu Ser Glu

<210> 26

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: forward primer
for the PCR amplification of murine IL-4

<220>

<221> misc_feature

<222> (9)..(11)

<223> translation initiation codon

<400> 26

tctagaccat gggctctcaac ccccagc

27

<210> 27

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: reverse
primer for the PCR amplification of murine IL-4

<220>

<221> misc_feature

<222> Complement((13)..(15))

<223> encodes the C-terminal amino acid residue of
murine IL-4

<400> 27

cgatatcccg gacgagtaat ccatttgcac gatgctcttt aggctttcca gg

52

<210> 28

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: coding
sequence at the junction between murine IL-4 and
murine GM-CSF

<220>

<221> misc_feature

<222> (1)..(12)

<223> encodes the C-terminal sequence of muIL4

<220>

<221> misc_feature

<222> (28)..(39)

<223> encodes the N-terminal sequence of muGM-CSF

<400> 28

atggattact cgtcgggat gggaaaagca cccgcccgc

39

<210> 29

<211> 32

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: forward primer
 for the PCR amplification of murine lymphotactin

 <220>
 <221> misc_feature
 <222> (13)..(15)
 <223> translation initiation codon

 <400> 29
 tctagagcca ccatgagact tctcctcctg ac 32

 <210> 30
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: reverse primer
 for the PCR amplification of murine lymphotactin

 <220>
 <221> misc_feature
 <222> Complement((7)..(9))
 <223> encodes the C-terminal amino acid residue of
 murine lymphotactin

 <400> 30
 ggatccccca gtcaggggta ctgctg 26

 <210> 31
 <211> 57
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: coding
 sequence at the junction between murine
 lymphotactin and KS-IL2 heavy chain

 <220>
 <221> misc_feature
 <222> (1)..(3)
 <223> encodes the C-terminal amino acid residue of
 murine lymphotactin

 <220>
 <221> misc_feature
 <222> (55)..(57)
 <223> encodes the N-terminal amino acid residue of the
 KS-IL2 heavy chain

 <400> 31
 cccggatccg gaggttcagg gggcggagggt agcggcggag ggggctcctt aagccag 57

<210> 32
<211> 17
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: protein
sequence at the junction between murine
lymphotactin and KS-IL2 heavy chain

<400> 32

Gly Ser Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Leu
1 5 10 15

Ser